minded; it compares the situation in other states of America; and makes certain definite recommendations not only as to the provision of clinics, schools, and institutions, but also as to the sterilisation and control of marriage in the case of certain anti-social classes.

The last chapter deals specifically with Eugenics. Eugenics, or "generative hygiene," is defined in its broader sense as comprising "not only the regulation of the function of mating, but also the establishment of conditions ensuring healthy generative processes in both father and mother." It thus contemplates not only those factors conditioning development which exist prior to and during conception, but also those operating during gestation and even during the first post-natal period—for example, breast-feeding.

Four "fundamental theses" are stated and supported. First, "society should prevent degenerate or anti-eugenical matings." This thesis leads to a discussion of studies of heredity. In Dr. Wallin's view "present-day heredity studies are usually conducted with either a distinct Galtonian or a Mendelian bias." On the whole, he himself inclines to the former. Without entirely subscribing to the criticisms passed upon the Mendelian conclusions of American workers by investigators in the Galton laboratory at London, he rightly insists that "the crux of the whole question is the first-hand accumulation of accurate data." The diagnosis of feeble-mindedness in children and their parents is just as difficult and technical as the diagnosis of bodily disease. It cannot be left to social workers or teachers who have merely had a short course on "heredity field work" or on the Binet tests. The defectives that are most prolific are not the obvious cases of idiocy or imbecility, but higher-grade cases. And these often cannot be diagnosed either by experts or by amateurs at a single interview. Intensive studies are needed for each individual case.

His second thesis is that "society should adopt measures to prevent the syphilisation of the unborn child." "The campaign must go on until laws have been placed upon the statute books everywhere, requiring the registration of infected persons, together with the prohibition of marriage or intercourse between such persons until they are cured. If this does not prove effective, we may be forced to follow army surgeons, who compel soldiers that will not live within the law to use prophylactics. This may not conform to our traditional principles of morality; but humanity is evolving a new ethical code based upon eugenic imperatives."

His third thesis is directed against "the alcoholisation of the parents and of embryonic and fœtal life." Here again his review of the evidence is admittedly not quite conclusive. And it might well be urged that under this heading, as under the preceding, more definite and decisive investigations will be required before public opinion will consent to drastic additions to the statute book.

Finally, "it is desirable to prevent procreation during the periods of physiological immaturity and of involution, and to prevent over-many or unwilling conceptions." He inclines not merely to compulsory sterilisation of all who ought not to beget children, but also to the optional sterilisation of those who do not want children and to enlightenment of the general public in the use of harmless regulatives. "Even relative depopulation is better than degeneration." CYRIL BURT.

Morgan, PROFESSOR T. H. *A Critique of the Theory of Evolution.* Princetown University Press; 1916; price $1.50; pp. 197.

THE object of this book is to give an account of the older and an appreciation of the newer evidence concerning evolution. In order to cover this wide area in four lectures or chapters, many topics have had to be treated in broad outline, some of the author's own experimental work, however, bulking somewhat largely. No objection should be raised on this

account; for a specialist in writing an elementary book often has but the choice of making it feel alive by such personal references or of failing to interest his readers. The first chapter reviews the general evidence in favour of a belief in evolution, and deals with the speculations associated with the names of St. Hilaire, Lamarck, Darwin, and others. Then follows a chapter on "Mendelism," illustrated by many references to the fruit fly, *Drosophila*, the insect to which the author has devoted so much attention. The third chapter gives the arguments in favour of the belief that the chromosomes form the basis of the mechanism of heredity. Lastly comes a chapter in which Darwin's theory of natural selection is criticised, and the author's own views on evolution set forth. Where other leading experts disagree with him, their conclusions are fairly dealt with, and the book is to be recommended to anyone wishing to appreciate the present state of the controversy concerning evolution.

Naturally, the last chapter is the one in which the most controversial topics are dealt with. Darwin's belief was that selection, acting on the minute differences which obviously exist between the different individuals of the same species, was the main agency in evolution. It is now, however, indisputable that these minute differences are in large measure due to a shuffling of the different types which are found existing within a species, and it is also admittedly difficult to prove that these types are in themselves in any way capable of being affected by selection. Our author's view seems to be that evolution has come about through the occurrence of mutations, or sudden and comparatively infrequent introductions of new factors into the mechanism of heredity, factors which influence the characters already present in the animal or plant. He differs from Darwin, as it seems to me, mainly in regard to the size and frequency of the changes on which selection has to work.

From the point of view of the eugenist, this controversy as to the fixity of factors is not of vital importance. If contrary to Darwin's views, selection by acting on the minute differences always existing between different individuals can do no more than pick out the best or the worst of the previously existing stocks, yet even on this supposition selection may produce great effects in improving or deteriorating the human race. As to the theoretical questions involved, the believers in Darwin's views must now argue their case mainly on the ground that certain facts are far more easily accounted for if very small mutations do frequently occur, and not because their occurrence has been actually proved. In the remarkable case of three types of female butterflies corresponding to only one type of male, Professor Morgan indicates the possibility "of explaining the case as due to two pairs of Mendelian factors," and argues that this furnishes "a much simpler explanation of the facts than that proposed by Darwin (p. 64). But is not the word "explanation" here used with two different significations? Does not Mendelism supply a description rather than explanation of how these female forms differ from each other? In one sense of the word, neither Morgan nor Darwin "explain" how mutations arise. What Darwin was seeking to do was to show how one organic form could have been changed into another on the assumption that small mutations do frequently occur; and, if this can be described as an "explanation," it is difficult to see how either the simultaneous adaptation of different parts of an animal, or the way in which certain insects have obtained protection by their extraordinary likeness to their inanimate surroundings, or other similar facts, can be explained by the existence of large and infrequent mutations. In fact, we are not yet at the end of the controversy concerning evolution.

L. D.